NAME: DATE:

Unit-2 Mastery Assessment (version 624)

Question 1 (10 points)

Let f represent a function. If $f[40] = 18$, then there exists a knowable solution to the equation below.

$$y = \frac{f[4\,(x+7)]}{6} + 9$$

Find the solution.

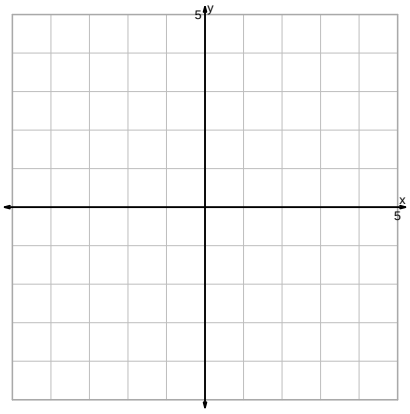
$x =$

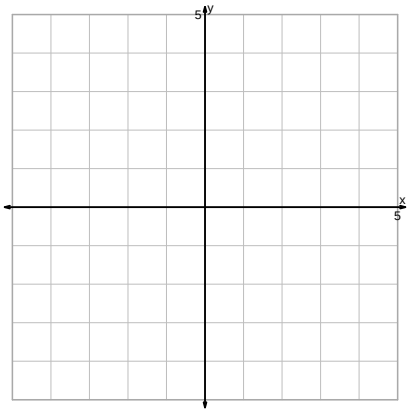
$y =$

Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

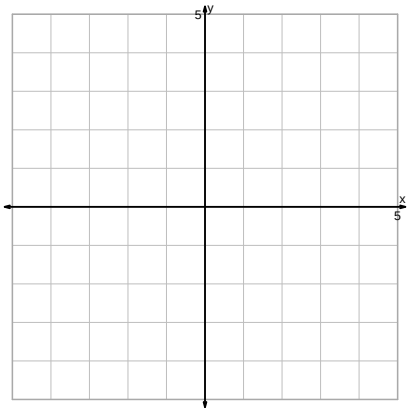
$y = \log_2(2x)$

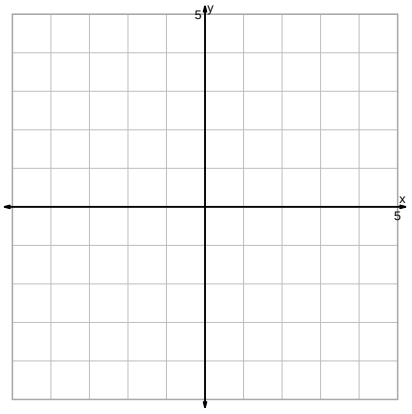




$y = \frac{x^3}{2}$

$y = x^2 + 2$

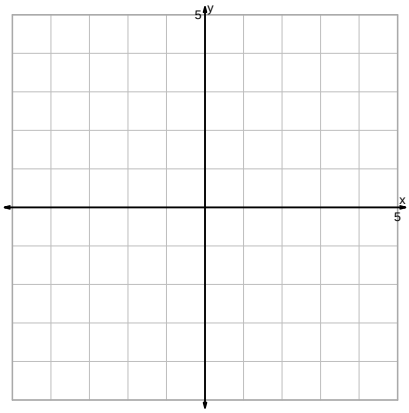


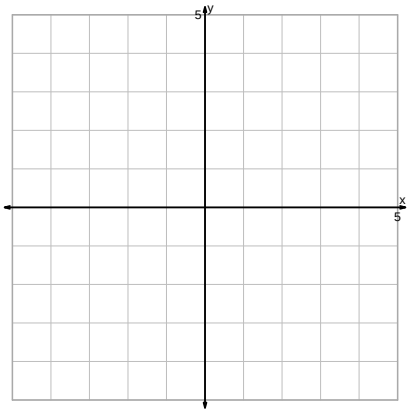


$y = \sqrt[3]{\frac{x}{2}}$

Question 2 continued...

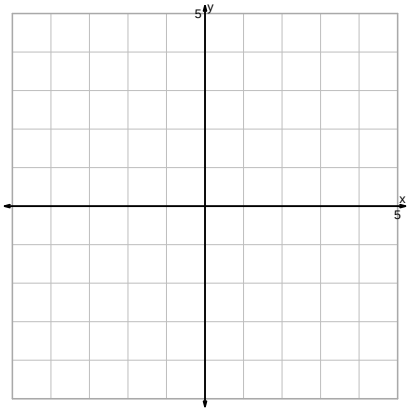
$y = \sqrt{x-2}$

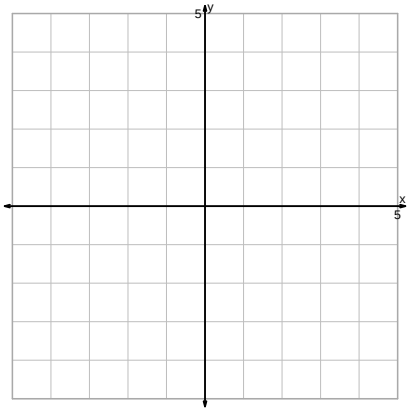




$y = \sqrt[3]{x+2}$

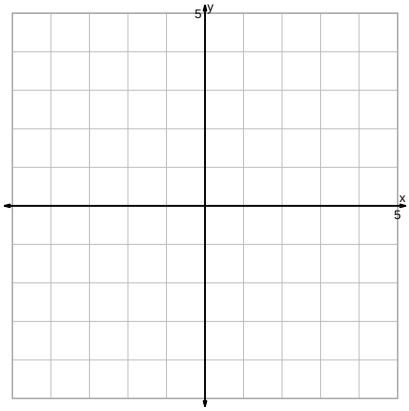
$y = 2 \cdot x^2$

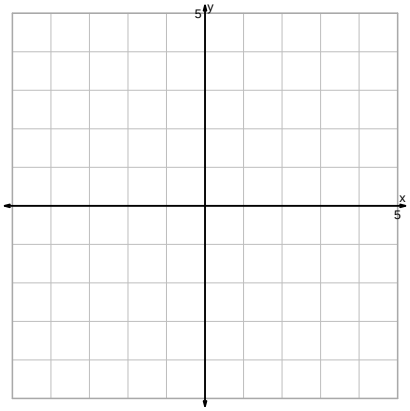




$y = \sqrt{-x}$

$y = -\log_2\left(x\right)$

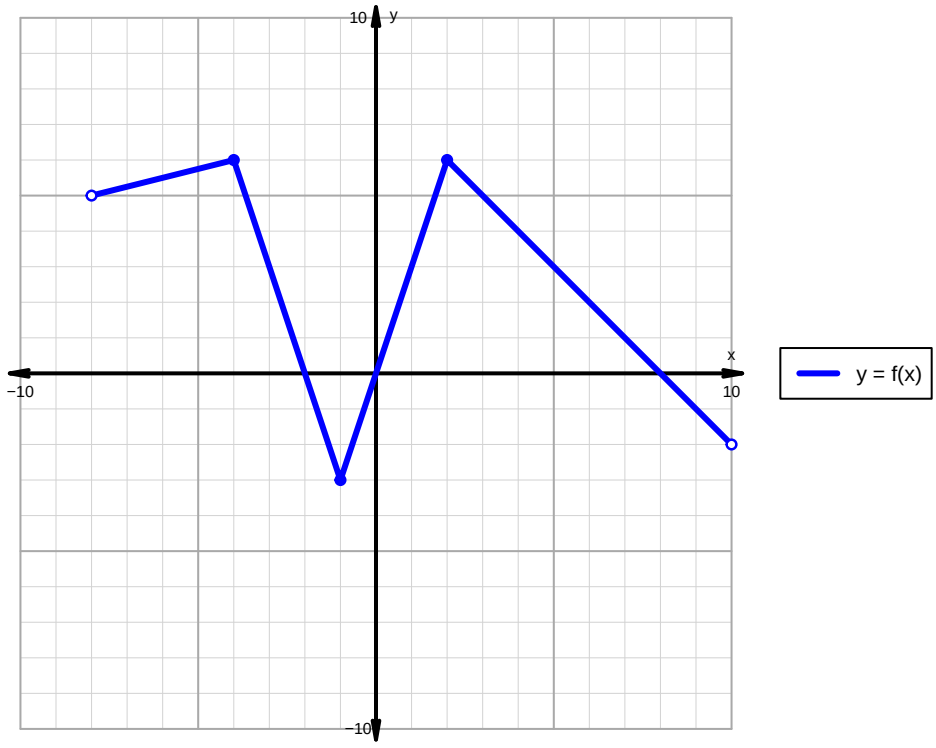




$y = x^3 - 2$

Question 3 (20 points)

A function is graphed below.



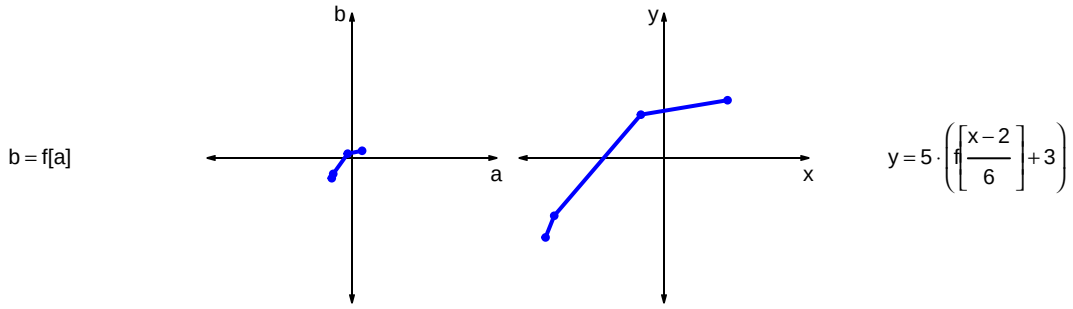
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = 5 \cdot \left(f\left[\frac{x-2}{6}\right] + 3\right)$ are represented below in a table and on graphs.

a	b	x	y
-14	-14	-82	-55
-13	-11	-76	-40
-3	3	-16	30
7	5	44	40



a. Write formulas for calculating x from a and calculating y from b. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 5 \cdot \left(f\left[\frac{x-2}{6}\right] + 3\right)$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

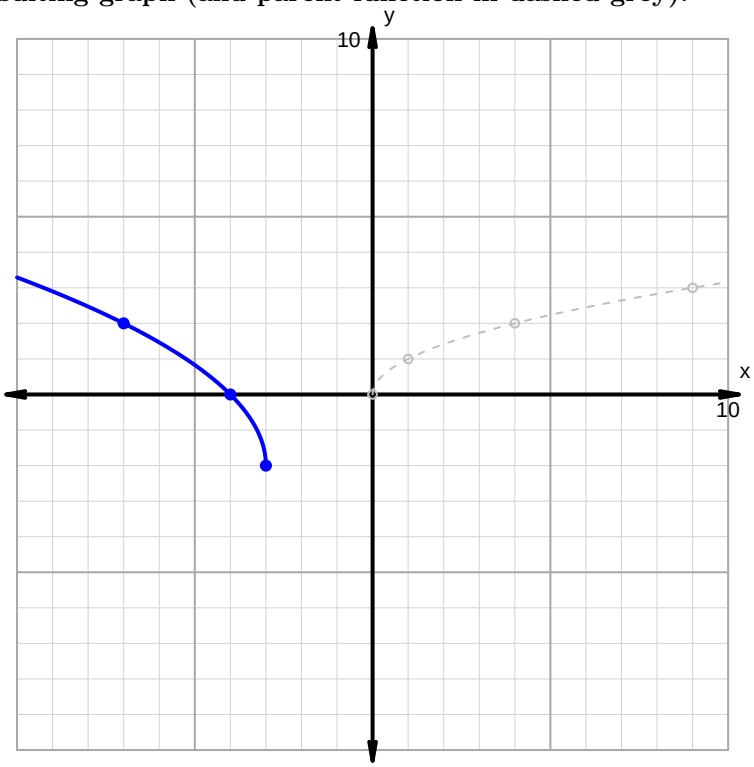
Horizontal transformations

1. Horizontal reflection over y axis.
2. Translate left by distance 3.

Vertical transformations

1. Translate down by distance 1.
2. Vertical stretch by factor 2.

Resulting graph (and parent function in dashed grey):

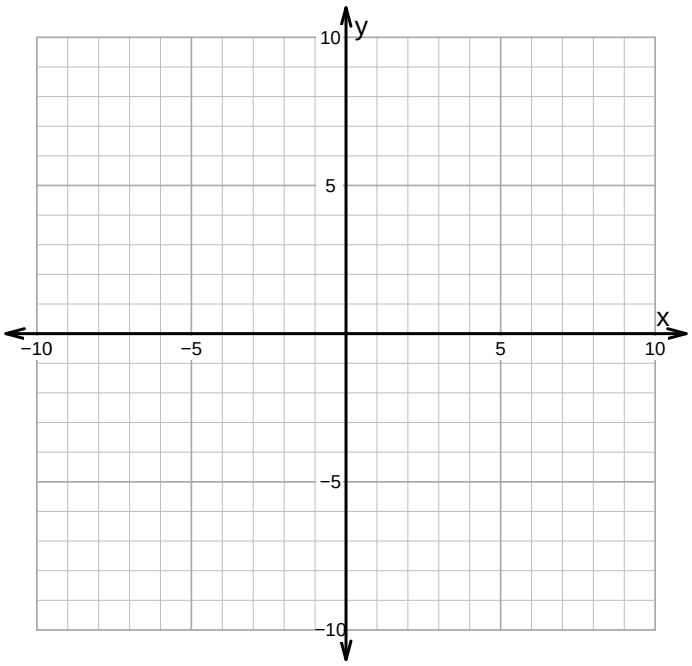


- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = \frac{1}{3} \cdot |x + 3| - 2$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	